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(54) A PROCESS FOR THE MANUFACTURE OF HARD CARAMELS

(71) We, F. HOFFMANN-LA ROCHE & Co., AKTIENGESELLSCHAFT, a Swiss Company of 124—184 Grenzacherstrasse, Basle, Switzerland, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention is concerned with a process for the manufacture of xylitol-containing hard caramels.

It is known to manufacture hard caramels of the usual type by boiling down saccharose-glucose syrup solutions up to a water content of about 1—3% with the addition of various aroma substances, citric acid, tartaric acid, lactic acid, constituents of milk, honey, malt or other additives. Such hard caramels possess a glass-like texture and splinter upon breaking. It is known that pure saccharose is not suitable for the manufacture of hard caramels and must therefore be mixed with glucose syrup in an amount of about one quarter to one fifth by weight (based on the finished product). In this case, the glucose syrup takes on the role of a crystallisation inhibitor and the finished product is obtained in the form of a glass-clear, amorphous and hard mass. Pure saccharose is, however, not even suitable for the manufacture of hard caramels which need not be absolutely glass-clear, but can be even opaque. In this case glucose must also be added.

When, as has already been proposed, the saccharose is replaced by xylitol in the manufacture of hard caramels in order to produce non-cariogenic hard caramels, practically the same difficulties appear as in connection with saccharose since a xylitol melt, just as in the case of saccharose, crystallises out after cooling to give a brittle mass which does not satisfy the normal requirements of hard caramels.

Since the use of glucose syrup in xylitol-containing hard caramels is out of the question because of the high cariogenicity of the glucose syrup, there exists a need for a process for the manufacture of xylitol-containing hard caramels the consistency of which, with the exception of the glass-like transparent texture, satisfies all requirements of hard caramels,

The aforementioned problem has now been solved in accordance with the present invention which provides a process for the manufacture of xylitol-containing hard caramels, said process comprising adding powdered xylitol to a xylitol melt at a temperature not substantially exceeding the melting temperature of the xylitol.

The term "powdered xylitol" as used in this specification means xylitol ground to powder with an average particle size of about 40μ to about 150μ, preferably about 60μ to about 100μ.

The addition of the powdered xylitol to the xylitol melt is carried out at a temperature not substantially exceeding the melting point of the xylitol since at a higher temperature the powder would likewise melt in the melt and the desired effect would accordingly not be achieved. Since xylitol, depending on purity, melts at about 93°—95°C, the addition of the powdered xylitol is carried out at at most this temperature, although the addition at a temperature of 1°C to 2°C thereover is not critical. The addition at a lower temperature is also not critical provided that a melt is still present.

The amount of powdered xylitol which is added to the xylitol melt in accordance with the present invention conveniently amounts to about 10 wt.% to about 30 wt.%, preferably about 15 wt.% to about 25 wt.% and especially about 20 wt.% to about 25 wt.%, based on the total weight of the caramel mass.

In carrying out the process in accordance with the present invention, the crystalline xylitol is conveniently heated up to the melting point in a suitable vessel such as, for example, a candy boiler, the powdered xylitol is then added to the melt while stirring and the mass obtained is poured into moulds in a manner known per se and left to solidify, the filling funnel installed for the feeding of the poured forms beng conveniently equipped above the connecting pipe with a jacket heater with a thermostate and an intensive stirrer.

In the present process, customary additives (e.g. fruit acids) can be added to the melt in amounts of about 0-3% to about 3%, for example citric acid in an amount of about 1%. In addition, there can be added certain salts for the purpose of rounding-off the flavour such as, for example, sodium citrate, alkali metal phosphates (e.g. sodium phosphate) or tartrates (e.g. sodium tartrate). Other additives which can be added include aroma substances such as, for example, orange, lemon, raspberry or like aromas, there being preferably added aroma substances which intensify the cooling effect of xylitol such as, for example, menthol, lemon aromas and the like. There can also be added synthetic or natural colouring agents such as, for example, azo colouring agents or carotenoids (e.g. β-carotene, canthaxanthin and the like). The total amount of additive should, however, conveniently not exceed about 3 wt.%. Moreover, it is possible to add to the melt up to 10 wt.% of sorbitol or mannitol without substantially lengthening the solidification time.

insofar as one or more of the previously mentioned additives is added in the form of an aqueous solution or suspension, this addition is preferably carried out prior to the addition of the powdered xylitol to the melt. In so doing, the temperature of the melt can be raised to a temperature above the melting point of xylitol (e.g. to about 110°—130°C) in order that the added water can be readily removed. Subsequently, and before the addition of the powdered xylitol, the melt must, however, be cooled down and brought to the temperature already mentioned previously.

The following Example illustrates the present invention:

Example

100 kg of crystalline xylitol and 1 kg of crystalline citric acid are heated to 120°C in an open candy boiler. As soon as the mixture is molten, 200 ml of β-carotene (10% water-soluble) are added to the melt. The water required for the suspension of the β-carotene is evaporated completely by stirring for a period of several minutes. 300 ml of orange aroma are then added while stirring. The mixture is subsequently cooled to 90°C. At this temperature 24 kg of powdered xylitol are added while stirring. The mass obtained, which is maintained at a constant temperature of 90°C during the stirring, has a viscosity such that it can readily be poured into small forms corresponding in form and size to caramels. Solidification takes place at room temperature after about 1 minute.

The storage capability of candies manufactured in the manner previously described is good and no hygroscopiscity can be determined in gas-permeable packaging at 25° and 50% relative air humidity.

WHAT WE CLAIM IS:—

1. A process for the manufacture of xylitol-containing hard caramels, which process comprises adding powdered xylitol to a xylitol melt at a temperature not substantially exceeding the melting point of xylitol.

2. A process according to claim 1, wherein the powdered xylitol is added at a temperature of at most 96°C.

3. A process according to claim 1 or claim 2, wherein the powdered xylitol is added in an amount of about 10 wt.% to about 30 wt.% based on the total weight of the caramel mass.

4. A process according to claim 3, wherein the powdered xylitol is added in an amount of about 15 wt.% to about 25 wt.% based on the total weight of the caramel mass.

5. A process according to claim 4, wherein the powdered xylitol is added in an amount of about 20 wt.% to about 25 wt.% based on the total weight of the caramel mass.

6. A process for the manufacture of xylitol-containing hard caramels, substantially as hereinbefore described with reference to the foregoing Example.

7. Xylitol-containing hard caramels, when manufactured by the process claimed in any one of claims 1 to 6 inclusive or by an obvious equivalent thereof.

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